

MILITARY SPECIFICATION

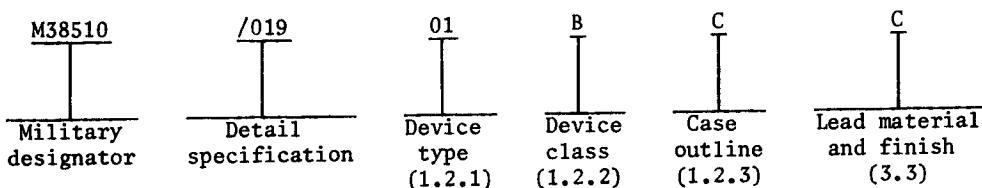
MICROCIRCUITS, DIGITAL  
TTL, PARITY GENERATORS/CHECKERS,  
MONOLITHIC SILICON

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, TTL, parity generators/checkers. Three product assurance classes and a choice of case outline/lead finish are provided for each type and are reflected in the complete part number.

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall be as shown in the following:

<u>Device type</u>	<u>Circuit</u>
01	8-bit odd/even parity generator/checker

1.2.2 Device class. The device class shall be the product assurance level as defined in MIL-M-38510.

1.2.3 Case outline. The case outline shall be designated as follows:

<u>Outline letter</u>	<u>MIL-M-38510, appendix C, case outline</u>
A	F-1 (14-pin, 1/4" x 1/4" flat pack)
B	F-3 (14-pin, 1/8" x 1/4" flat pack)
C	D-1 (14-pin, 1/4" x 3/4" dual-in-line pack)
D	F-2 (14-pin, 1/4" x 3/8" flat pack)

1.3 Absolute maximum ratings.

Supply voltage range - - - - - - - - - - -0.5 Vdc to 7.0 Vdc

Input voltage range - - - - - - - - - - -1.5 Vdc at -12 mA to 5.5 Vdc

Storage temperature range - - - - - - - - -65°C to 150°C

Maximum power dissipation  $P_D$  1/- - - - 270 mWdc

Lead temperature (soldering

10 seconds) - - - - - - - - - - -300°C

Thermal resistance, junction to case - -  $\theta_{JC} = \begin{cases} 0.09^\circ\text{C}/\text{mW} & \text{for flat pack} \\ 0.08^\circ\text{C}/\text{mW} & \text{for dual-in-line pack} \end{cases}$

Junction temperature - - - - -  $T_J = 175^\circ\text{C}$

1/ Must withstand the added  $P_D$  due to short circuit condition (e.g.,  $I_{OS}$ ) at one output for 5 seconds duration.

1.4 Recommended operating conditions:

Supply voltage - - - - -	4.5 Vdc minimum to 5.5 Vdc maximum
Minimum high level input voltage - - -	2.0 Vdc
Maximum low level input voltage- - - -	0.8 Vdc
Normalized fanout (each output)	
Logical high- - - - -	20 maximum
Logical low - - - - -	10 maximum
Ambient operating temperature range- - -	-55°C to 125°C

**2. APPLICABLE DOCUMENTS**

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

**3. REQUIREMENTS**

3.1 Detail specifications. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510, and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Truth tables. The truth tables shall be as specified on figure 2.

3.2.3 Logic diagram. The logic diagram shall be as specified on figure 3.

3.2.4 Schematic circuit. The schematic circuit shall be as specified on figure 4.

3.2.5 Case outlines. The case outlines shall be in accordance with 1.2.3.

3.3 Lead material and finish. Lead material and finish shall be in accordance with MIL-M-38510.

3.4 Electrical performance characteristics. The electrical performance characteristics are as specified in table I and apply over the full recommended ambient operating temperature range, unless otherwise specified.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions	Test limits		
			Min	Max	Unit
High level output voltage	$V_{OH}$	$V_{CC} = 4.5 \text{ V}$ , $V_{IH} = 2 \text{ V}$ $V_{IL} = 0.8 \text{ V}$ , $I_{OH} = -800 \mu\text{A}$	2.4	---	V
Low level output voltage	$V_{OL}$	$V_{CC} = 4.5 \text{ V}$ , $V_{IH} = 2 \text{ V}$ $V_{IL} = 0.8 \text{ V}$ , $I_{OL} = 16 \text{ mA}$	---	0.4	V
Input clamp voltage	$V_{IC}$	$V_{CC} = 4.5 \text{ V}$ , $I_{IN} = -12 \text{ mA}$ $T_A = 25^\circ\text{C}$	---	-1.5	V
High level input current	$I_{IH1}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 2.4 \text{ V}$	---	40	$\mu\text{A}$
High level input current	$I_{IH2}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 5.5 \text{ V}$	---	1	mA
Low level input current	$I_{IL}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 0.4 \text{ V}$	-0.7	-1.6	mA
Short circuit output current	$I_{OS}$	$V_{CC} = 5.5 \text{ V}$ <u>1/</u>	-20	-55	mA
Supply current	$I_{CC}$	$V_{CC} = 5.5 \text{ V}$ , $V_{odd} = V_{even} = 2.4 \text{ V}$	---	49	mA
Propagation delay to high logic level (data to $\Sigma$ even, even input grounded)	$t_{PLH1}$	$C_L = 50 \text{ pF}$ , $R_L = 400\Omega$	2	67	ns

See footnote at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions	Test limits		
			Min	Max	Unit
Propagation delay to low logic level (data to $\Sigma$ even, even input grounded)	$t_{PHL1}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	54	ns
Propagation delay to high logic level (data to $\Sigma$ even, odd input grounded)	$t_{PLH2}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	83	ns
Propagation delay to low logic level (data to $\Sigma$ even, odd input grounded)	$t_{PHL2}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	96	ns
Propagation delay to high logic level (data to $\Sigma$ odd, odd input grounded)	$t_{PLH3}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	67	ns
Propagation delay to low logic level (data to $\Sigma$ odd, odd input grounded)	$t_{PHL3}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	54	ns
Propagation delay to low logic level (data to $\Sigma$ odd, even input grounded)	$t_{PLH4}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	83	ns
Propagation delay to low logic level (data to $\Sigma$ odd, even input grounded)	$t_{PHL4}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	93	ns
Propagation delay to high logic level (even or odd to $\Sigma$ even or $\Sigma$ odd)	$t_{PLH5}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	31	ns
Propagation delay to low logic level (even or odd to $\Sigma$ even or $\Sigma$ odd)	$t_{PHL5}$	$C_L = 50 \text{ pF}, R_L = 400\Omega$	2	17	ns

1/ Not more than one output should be shorted at a time.

3.5 Rebonding. Rebonding shall be in accordance with MIL-M-38510.

3.6 Electrical test requirements. Electrical test requirements shall be as specified in table III for the applicable device type and device class. The subgroups of table III which constitute the minimum electrical test requirements for screening, qualification, and quality conformance by device class are specified in table II.

3.7 Marking. Marking shall be in accordance with MIL-M-38510 and 1.2. At the option of the manufacturer, the following marking may be omitted from the body of the microcircuit, but shall be retained on the initial container:

- (a) Country of origin.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirement	Subgroups (see table III)		
	Class A devices	Class B devices	Class C devices
Interim electrical parameters (pre burn-in) (method 5004)	1	1	None
Final electrical test parameters (method 5004)	1*, 2, 3, 9, 10, 11	1*, 2, 3, 9	1
Group A test requirements (method 5005)	1, 2, 3, 9 10, 11	1, 2, 3, 9	1, 2, 3, 9
Group C end point electrical parameters (method 5005)	1, 2, 3	1, 2, 3	1
Additional electrical subgroups for group C periodic inspections	None	10, 11	10, 11

\*PDA applies to subgroup 1 (see 4.3(h)).

#### 4. PRODUCT ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and method 5005 of MIL-STD-883, except as modified herein.

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified herein for groups A, B, and C inspections (see 4.4.1, 4.4.2, and 4.4.3). After qualification of one or more electrically and structurally similar types with a single lead finish, other lead finishes of the same case outline may be qualified by submitting a single type in the qualified case outline to the group B, subgroup 3 test and the group C, subgroups 1, 3, and 4 tests.

4.3 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

- (a) Test samples for the group B bond strength test specified in method 5005 of MIL-STD-883 may, at the manufacturer's option, be randomly selected immediately following the internal visual (precap) inspection and prior to sealing (see 4.4.2(a)).

- (b) Burn-in test (method 1015 of MIL-STD-883).
  - (1) Test condition D or E, using the circuit shown on figure 5, or equivalent.
  - (2)  $T_A = 125^\circ\text{C}$  minimum.
- (c) Reverse bias burn-in and interim electrical test in accordance with 3.1.10 of method 5004 of MIL-STD-883 may be omitted.
- (d) Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- (e) Percent defective allowable (PDA) - The PDA is specified as 5 percent for class A devices and 10 percent for class B devices based on failures from group A, subgroup 1 test after cooldown as final electrical test in accordance with method 5004 of MIL-STD-883, and with no intervening electrical measurements. If interim electrical parameter tests are performed prior to burn-in, failures resulting from pre burn-in screening may be excluded from the PDA. If interim electrical parameter tests prior to burn-in are omitted, then all screening failures shall be included in the PDA.

The verified failures of group A, subgroup 1 after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent defective for that lot, and the lot shall be accepted or rejected based on the PDA for the applicable device class.

**4.4 Quality conformance inspection.** Quality conformance inspection shall be in accordance with MIL-M-38510.

**4.4.1 Group A inspection.** Group A inspection shall consist of the test subgroups and LTPD values shown in table I of method 5005 of MIL-STD-883 and as follows:

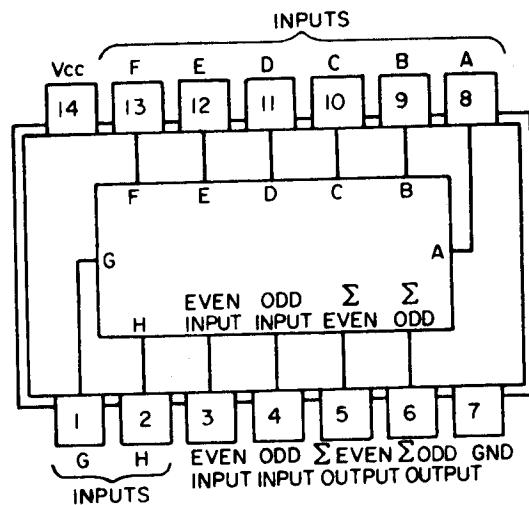
- (a) Tests shall be as specified in table II.
- (b) Subgroups 4, 5, and 6 shall be omitted.

**4.4.2 Group B inspection.** Group B inspection shall consist of the test subgroups and LTPD values shown in table II of method 5005 of MIL-STD-883 and as follows:

- (a) Bond strength test may be conducted on samples collected prior to sealing (see 4.3(a)).

**4.4.3 Group C inspection.** Group C inspection shall consist of the test subgroups and LTPD values shown in table III of method 5005 of MIL-STD-883 and as follows:

- (a) End point electrical parameters shall be as specified in table II.
- (b) Subgroups 7 and 8 shall be added to the group C inspection requirements for class B and class C devices and shall consist of the tests, conditions, and limits specified for subgroups 10 and 11 of group A.
- (c) High temperature storage test (method 1008 of MIL-STD-883) conditions:
  - (1) Temperature:  $150 \pm 10^\circ\text{C}$ .
  - (2) Duration: 1,000 hours, except as otherwise permitted by appendix B of MIL-M-38510.
- (d) Operating life test (method 1005 of MIL-STD-883) conditions:
  - (1) Test condition D or E, using the circuit shown on figure 5, or equivalent.
  - (2)  $T_A = 125^\circ\text{C}$ , minimum.
  - (3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510.
- (e) Omit steady state reverse bias test.

FIGURE 1. Terminal connections (top view).

INPUTS			OUTPUTS	
$\Sigma$ of H's At A thru H	EVEN	ODD	$\Sigma$ EVEN	$\Sigma$ ODD
EVEN	H	L	H	L
ODD	H	L	L	H
EVEN	L	H	L	H
ODD	L	H	H	L
X	H	H	L	L
X	L	L	H	H

X = Irrelevant

FIGURE 2. Truth table.

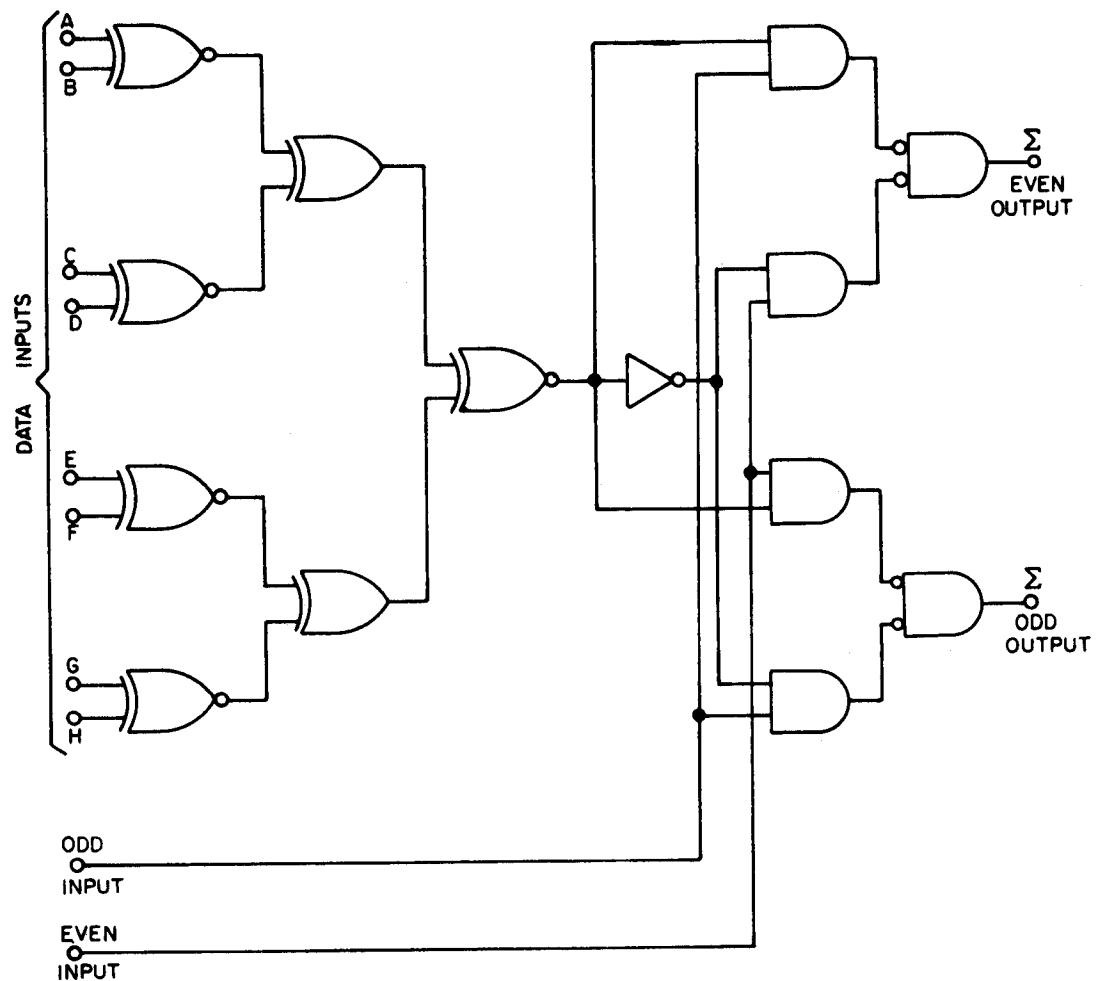
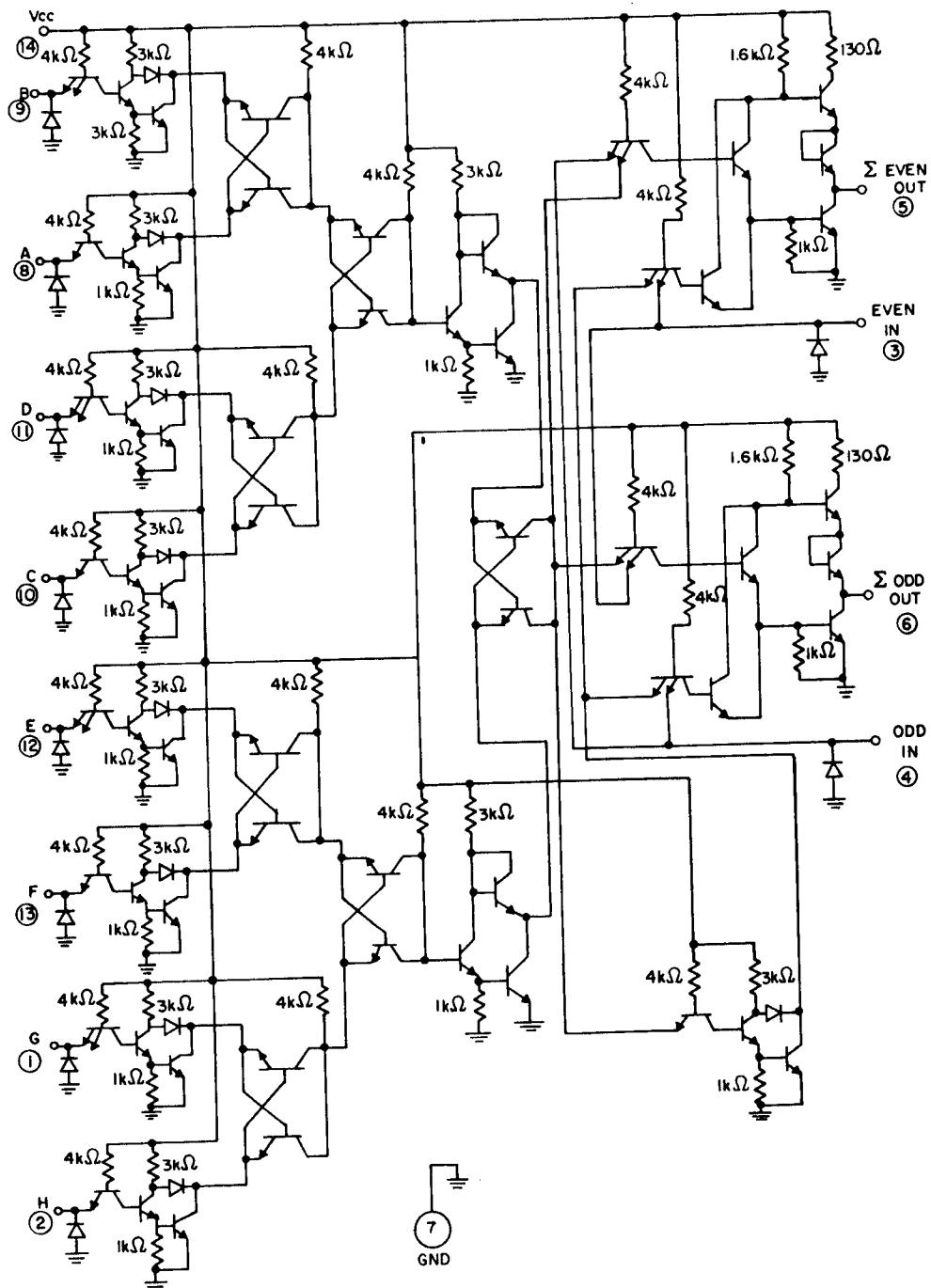
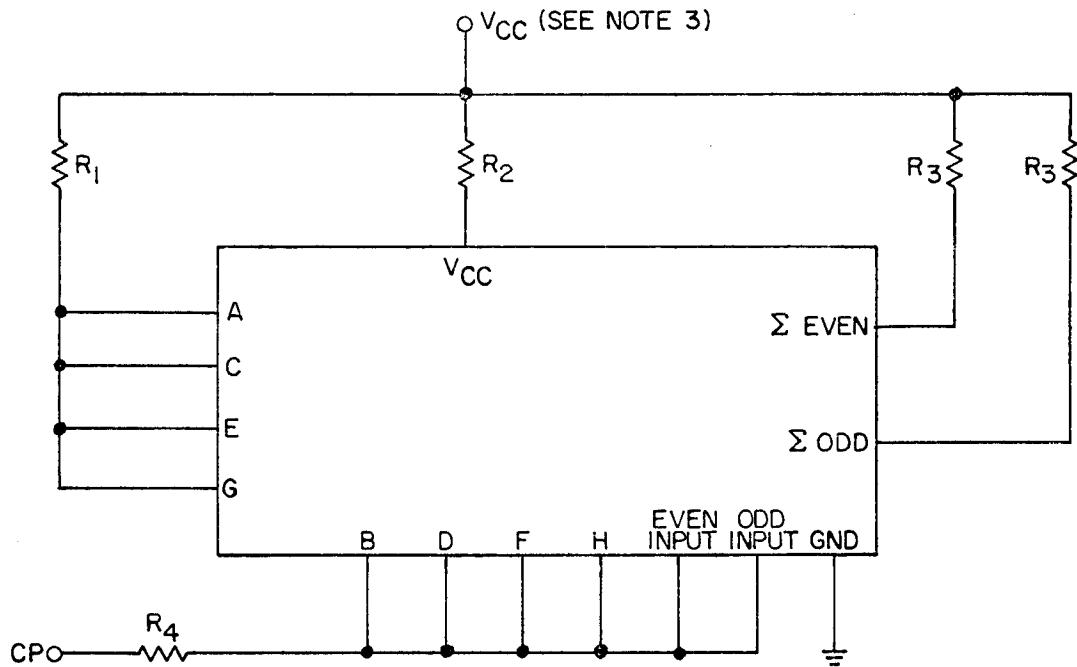


FIGURE 3. Logic diagram.

## Device type 01

FIGURE 4. Schematic circuit.

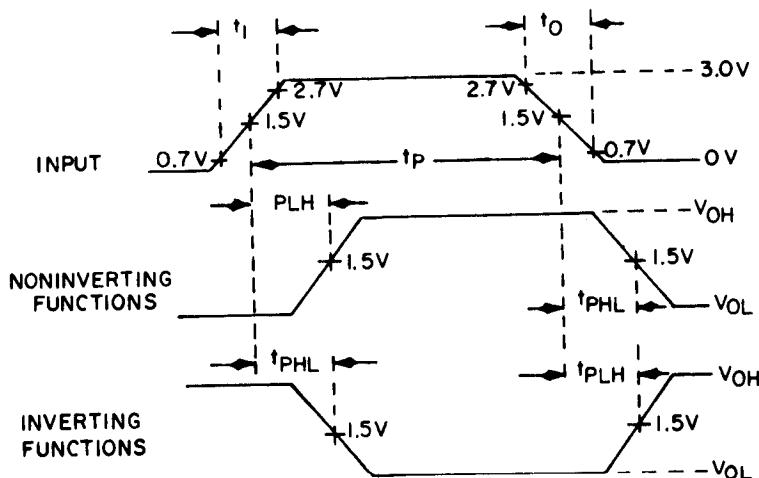
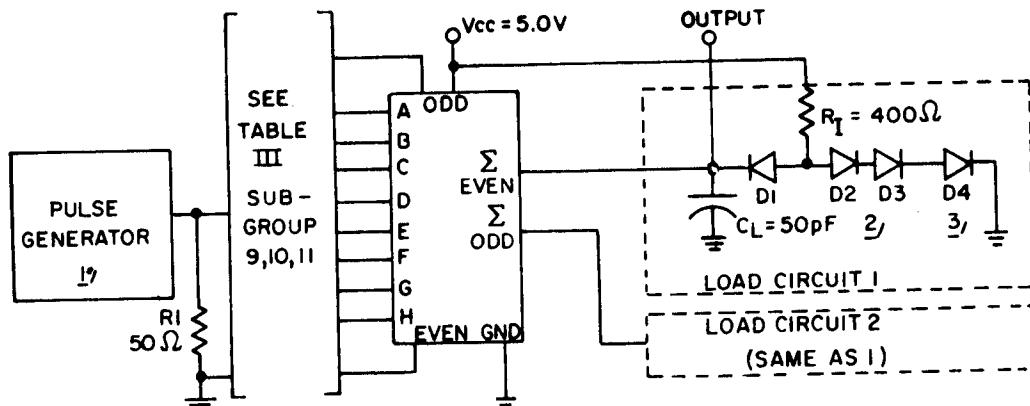
## Device type 01



## NOTES:

1.  $R_1 = 1 \text{ k}\Omega \pm 5\%$ ;  $R_2 = 4.7\Omega \pm 5\%$ ;  
 $R_3 = 220\Omega \pm 5\%$ ;  $R_4 = 27\Omega \pm 5\%$ .
2.  $CP = 100 \text{ kHz}$ , 0-3 V square wave, 50% duty cycle.
3. Voltage shall be such that a minimum of 5.0 V shall be present at  $V_{CC}$  terminal.

FIGURE 5. Burn-in and life test circuit.



## NOTES:

1. The pulse generator has the following characteristics:  $V_{gen} = 3 \text{ V}$ ,  $t_1 = t_0 = 10 \text{ ns}$ ,  $t_p = 500 \text{ ns}$ ,  $\text{PRR} = 1 \text{ MHz}$ , and  $Z_{out} \approx 50\Omega$ .
2.  $C_L$  includes probe and jig capacitance.
3. All diodes are 1N3064 or equivalent.
4. Load circuits for a given output are required only when the specific test in table III indicates "OUT" for that output. Otherwise load circuits may be omitted.

FIGURE 6. Switching time test circuit.

TABLE III. Group A inspection for device type 01.

Subgroup	Symbol	MIL-STD-883 method	Case A,B,C,D	Test No.	Terminal conditions (pins not designated may be high $\geq 2.0$ V or low $\leq .8$ V, or open)										Test limits				
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	
$T_A = 25^\circ C$	V <sub>OH</sub>	3006	1	2.0 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	-0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA	-0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA	GND	2.0 V	0.8 V	2.0 V	0.8 V	2.0 V	0.8 V	4.5 V	2.4 V	Vdc
	V <sub>OL</sub>	3007	6	2.0 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	-0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA	-0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA -0.8 mA	GND	2.0 V	0.8 V	2.0 V	0.8 V	2.0 V	0.8 V	4.5 V	2.4 V	Vdc
	V <sub>IC</sub>	13	12	2.0 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V 0.8 V	16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA	16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA 16 mA	-12 mA	-12 mA	-12 mA	-12 mA	-12 mA	-12 mA	-12 mA	-1.5 μA		
	I <sub>HH1</sub>	3010	23	24															
	I <sub>HP2</sub>	36	36	25															
		37	26																
		38	27																
		39	28																
		40	29																
		41	30																
		42	31																
		43	32																
		44	33																
		45	34																
		46	35																

TABLE III. Group A inspection for device type 01 - Continued.

Subgroup	Symbol	Case A,B,C,D	MIL-STD-883 method	Terminal conditions (pins not designated may be high $\geq 2.0$ V or low $\leq .8$ V, or open)								Test limits				
				1	2	3	4	5	6	7	8	9	10	11	12	13
1 TA = 25°C	I <sub>LL1</sub>	3009	47													
			48													
			49													
			50													
			51													
			52													
			53	0.4 V												
			54	2.0 V	0.4 V											
			55	GND	0.4 V											
			56		0.4 V											
			57		0.4 V											
			58		0.4 V											
	I <sub>OS</sub>	3011	59	0.8 V	2.0 V	GND	GND									
	I <sub>OS</sub>	3011	60	0.8 V	2.0 V	GND	GND									
	I <sub>CC</sub>	3005	61					2.4 V	2.4 V							

2 Same tests, terminal conditions, and limits as subgroup 1, except TA = 125°C and VIC tests are omitted.

3 Same tests, terminal conditions, and limits as subgroup 1, except TA = -55°C and VIC tests are omitted.

9 TA = 25°C	tPLHI (Fig 6)	3008	62	GND	GND	5.0 V	OUT			GND	GND	GND	GND	5.0 V	A to Even
		63								GND	IN	GND			Σ Even
			64							GND	IN	GND			Σ Even
			65							GND	IN	GND			Σ Even
			66							GND	IN	GND			Σ Even
			67							GND	IN	GND			Σ Even
			68							GND	IN	GND			Σ Even
			69							GND	IN	GND			Σ Even

TABLE III. Group A inspection for device type 01 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq .8$  V, or open)

Subgroup	Symbol	MIL-STD-883 method	Test No.	Case A,B,C,D				GND	5.0 V	OUT	Odd IN	$\geq$ Even OUT	Odd OUT	GND	IN	GND	GND	GND	VCC	Meas. terminal	Test limits				
				1	2	3	4														Min	Max	Unit		
9 $T_A = 25^\circ C$	tPHL1	3003 (Fig 6)	70	GND	GND	5.0 V	OUT																2	42	ns
			71																						
			72																						
			73																						
			74																						
			75	IN																					
			76																						
			77	GND	IN																				
	tPLH2		78	GND	GND	5.0 V	OUT																		64
			79																						
			80																						
			81																						
			82																						
			83	IN																					
			84																						
			85	GND	IN																				
	tPHL2		86	GND	GND	5.0 V	OUT																		72
			87																						
			88																						
			89																						
			90																						
			91	IN																					
			92																						
			93	GND																					

TABLE III. Group A inspection for device type 01 - Continued  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq .8$  V, or open)

Subgroup	Symbol	Case A,B,C,D	MIL-STD-883 method	Test No.	Test limits													
					1	2	3	4	5	6	7	8	9	10	11	12	13	14
9 $T_A = 25^\circ C$	tPLH3	3003 (Fig 6)	94	GND	IN	Even	Odd	$\Sigma$ Even	$\Sigma$ Odd	OUT	GND	IN	Inp A	Inp B	Inp C	GND	5.0 V	A to $\Sigma$ Odd
			95	GND	5.0 V	GND				OUT	GND	IN	GND	GND	GND	GND		B to $\Sigma$ Odd
			96															C to $\Sigma$ Odd
			97															D to $\Sigma$ Odd
			98															E to $\Sigma$ Odd
			99															F to $\Sigma$ Odd
			100															G to $\Sigma$ Odd
			101															H to $\Sigma$ Odd
	tPHL3		102	GND	GND	5.0 V	GND			OUT	IN	GND	GND	GND	GND	GND		42
			103															A to $\Sigma$ Odd
			104															B to $\Sigma$ Odd
			105															C to $\Sigma$ Odd
			106															D to $\Sigma$ Odd
			107															E to $\Sigma$ Odd
			108															F to $\Sigma$ Odd
			109															G to $\Sigma$ Odd
	tPLH4		110	GND	GND	5.0 V	GND			OUT	IN	GND	GND	GND	GND	GND		64
			111															A to $\Sigma$ Odd
			112															B to $\Sigma$ Odd
			113															C to $\Sigma$ Odd
			114															D to $\Sigma$ Odd
			115															E to $\Sigma$ Odd
			116															F to $\Sigma$ Odd
			117															G to $\Sigma$ Odd
																		H to $\Sigma$ Odd

TABLE III. Group A inspection for device type 01 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq .8$  V, or open)

Subgroup	Symbol	MIL-STD-883 method	Case A,B,C,D	Test No.										Test limits			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14
$T_A = 25^\circ C$	$t_{PHL4}$	3003 (Fig 6)	118	GND	Inp G	Inp H	Even IN	Odd IN	$\Sigma$ Even OUT	$\Sigma$ Odd OUT	GND	Inp A	Inp B	Inp C	Inp D	Inp E	A to $\Sigma$ Odd
			119	GND	GND	GND	5.0 V				GND			GND	GND	GND	B to $\Sigma$ Odd
			120														C to $\Sigma$ Odd
			121														D to $\Sigma$ Odd
			122														E to $\Sigma$ Odd
	$t_{PLH5}$	123															F to $\Sigma$ Odd
			124														G to $\Sigma$ Odd
			125	GND	IN												H to $\Sigma$ Odd
			126	5.0 V	5.0 V	IN	GND	OUT	OUT	OUT	GND						
			127														
$T_A = 125^\circ C$	$t_{PLH1}$	3003 (Fig 6)	128														
			129														
			130														
			131														
			132														
			133														
			134	GND	GND	5.0 V	OUT										
			135														
			136														
			137														
	$t_{PLH1}$	138															
			139														
			140														
			141	GND	IN												

TABLE III. Group A inspection for device type 01 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0$  V or low  $\leq .8$  V, or open)

Subgroup	Symbol	Case A,B,C,D	Test No.	MIL-STD-883 method (Fig 6)	Terminal conditions (pins not designated may be high $\geq 2.0$ V or low $\leq .8$ V, or open)								Test limits					
					1	2	3	4	5	6	7	8	9	10	11	12	13	14
10 $T_A = 125^{\circ}C$	tPHL1	3003	142	GND	IN	Even	IN	Odd	$\Sigma$ Even	$\Sigma$ Odd	OUT	GND	IN	Imp A	Imp B	Imp C	Imp D	Imp E
			143											GND	GND	GND	GND	GND
			144											GND	IN	GND	GND	5.0 V
			145											GND	IN	GND	GND	
			146											GND	IN	GND	GND	
			147											GND	IN	GND	GND	
			148											GND	IN	GND	GND	
			149											GND	IN	GND	GND	
			150											GND	IN	GND	GND	
			151											GND	IN	GND	GND	
			152											GND	IN	GND	GND	
			153											GND	IN	GND	GND	
			154											GND	IN	GND	GND	
			155											GND	IN	GND	GND	
			156											GND	IN	GND	GND	
			157											GND	IN	GND	GND	
			158											GND	IN	GND	GND	
			159											GND	IN	GND	GND	
			160											GND	IN	GND	GND	
			161											GND	IN	GND	GND	
			162											GND	IN	GND	GND	
			163											GND	IN	GND	GND	
			164											GND	IN	GND	GND	
			165											GND	IN	GND	GND	

TABLE III. Group A inspection for device type 01 - Continued.  
Terminal conditions (pins not designated may be high  $\geq 2.0 \text{ V}$  or low  $\leq .8 \text{ V}$ , or open)

Subgroup	Symbol	MIL-STD-883 method	Case A,B,C,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas. terminal	Test limits			
																			Min	Max	Unit	
$T_A = 125^\circ\text{C}$	tPLH3	3003 (Fig 6)	GND	166	GND	GND	5.0 V	GND		OUT	GND	5.0 V	A to $\Sigma$ Odd	2	67	ns						
				167															B to $\Sigma$ Odd			
				168															C to $\Sigma$ Odd			
				169															D to $\Sigma$ Odd			
				170															E to $\Sigma$ Odd			
				171															F to $\Sigma$ Odd			
				172															G to $\Sigma$ Odd			
				173															H to $\Sigma$ Odd			
				174																		
				175																		
				176																		
				177																		
				178																		
				179																		
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TABLE III. Group A inspection for device type 01 - Continued.

Subgroup	Symbol	MIL-STD-883 method	Case A,B,C,D	Terminal conditions (pins not designated may be high $\geq 2.0$ V or low $\leq .8$ V, or open)								Meas. terminal	Test limits				
				1	2	3	4	5	6	7	8	9	Min	Max	Unit		
10 TA = 125°C	tPHL4	3003 (Fig 6)	190	GND	GND	5.0 V			OUT T	GND	IN	GND	GND	5.0 V	A to $\Sigma$ Odd	2	93 ns
			191												B to $\Sigma$ Odd		
			192												C to $\Sigma$ Odd		
			193												D to $\Sigma$ Odd		
			194												E to $\Sigma$ Odd		
			195												F to $\Sigma$ Odd		
			196												G to $\Sigma$ Odd		
			197												H to $\Sigma$ Odd		
	tPLH5		198	5.0 V	5.0 V	IN	GND	OUT		OUT		GND	5.0 V	5.0 V	Even IN to $\Sigma$ Even	31	
			199												Even IN to $\Sigma$ Odd		
			200												Odd IN to $\Sigma$ Even		
			201												Odd IN to $\Sigma$ Odd		
	tPHL5		202	5.0 V	5.0 V	IN	GND	OUT		OUT		GND	5.0 V	5.0 V	Even IN to $\Sigma$ Even	17	
			203												Even IN to $\Sigma$ Odd		
			204												Odd IN to $\Sigma$ Even		
			205												Odd IN to $\Sigma$ Odd		

11 Same tests, terminal conditions and limits as subgroup 10, except TA = -55°C.

**4.5 Methods of examination and test.** Methods of examination and test shall be as specified in the appropriate tables and as follows.

**4.5.1 Voltage and current.** All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

**4.5.2 Life test cooldown procedure.** When devices are measured at 25 C following application of the operating life or burn-in test condition, they shall be cooled to room temperature prior to removal of the bias. Alternately, the bias may be removed during cooling if the case temperature is reduced to room temperature within 30 minutes after removal of the test condition.

**4.6 Inspection of preparation for delivery.** Inspection of preparation for delivery shall be in accordance with MIL-M-38510, except that the rough handling test shall not apply.

## 5. PREPARATION FOR DELIVERY

**5.1 Preservation-packaging and packing.** Microcircuits shall be prepared for delivery in accordance with MIL-M-38510.

## 6. NOTES

**6.1 Notes.** The notes specified in MIL-M-38510 are applicable to this specification.

**6.2 Intended use.** Microcircuits conforming to this specification are intended for use for Government microcircuit applications (original equipment) and logistic purposes.

**6.3 Ordering data.** The contract or order should specify the following:

- (a) Complete part number (see 1.2).
- (b) Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- (c) Requirement for certificate of compliance, if applicable.
- (d) Requirements for notification of change of product or process to procuring activity in addition to notification to the qualifying activity, if applicable.
- (e) Requirements for packaging and packing.
- (f) Requirements for failure analysis (including required test condition of Method 5003), corrective action and reporting of results, if applicable.
- (g) Requirements for product assurance options.
- (h) Requirements for carriers, special lead lengths or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.

**6.4 Abbreviations, symbols, and definitions.** The abbreviations, symbols, and definitions used herein are defined in MIL-STD-1313, MIL-STD-1331, and as follows:

GND - - - - - Electrical ground (common terminal)  
V<sub>IN</sub> - - - - - Voltage level at an input terminal

**6.5 Logistic support.** Lead materials and finishes (see 3.3), are interchangeable. Unless otherwise specified, microcircuits procured for Government logistic support will be procured to device class B (see 1.2.2) and lead material and finish C (see 3.3). There is no substitute for case outline C. Longer length leads and lead forming shall not affect the part number.

6.6 Substitutability. Microcircuits covered by this specification unilaterally supersede the following commercial device type:

<u>Device type</u>	<u>Commercial type</u>
01	54180

Custodian:  
Air Force - 17

Preparing activity:  
Air Force - 17

Review activities:  
Air Force - 11, 70, 80  
DSA - ES

Agent:  
DSA - ES

(Project 5962-F113)

User activity:  
Air Force - 19

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